Understanding the Diversity: A Taxonomy for Postsecondary Education Programs and Services for Students with Intellectual and Developmental Disabilities

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Abstract

The number of postsecondary education (PSE) programs for individuals with intellectual and developmental disabilities (IDD) has been steadily growing over the last few decades. There has been little public information regarding these programs and schools. Consequently, students, families, and researchers alike lack details about the various postsecondary options available to students with IDD. In response, the researchers developed a taxonomy to delineate the characteristics of PSE programs for individuals with IDD, laying the foundation for further study and development. The taxonomy was developed in two phases. Using a case study approach, a diverse range of 21 programs in 2- and 4-year institutions of higher education were selected. Information was gathered from each program through interviews with disability service staff and program directors, and through a review of program documents. After creating an initial taxonomy from interview and document data, a validation phase was conducted using an online survey. The iterative process of analyzing the in-depth interview data, program materials, and survey responses, as well as constructing a logical, well-ordered taxonomy resulted in a structure that has 4 domains, 16 components, and over 100 elements. The PSE Taxonomy provides a mechanism for combining elements to provide a more comprehensive understanding of PSE programs, to clarify differences and similarities between programs, and to develop succinct, easily comparable program profiles.

Keywords: Transition, postsecondary, intellectual disability, taxonomy

Recently, postsecondary education (PSE) programs for persons with intellectual and developmental disabilities (IDD) have increased in number, supported by federal policy, grant initiatives, and the work of advocates. Community inclusion, independent living, and improved employment outcomes for people with IDD are frequently cited as benefits of participating in a PSE program (Migliore & Butterworth, 2009; Newman et al., 2011). A major federal initiative, the Transition and Postsecondary Programs for Students with Intellectual Disabilities (TPSID) grants program funded by the U.S. Department of Education's Office of Postsecondary Education ([OPE], 2010), is currently supporting the development of a range of new PSE programs. Many older PSE programs for youth with IDD—those established 10-20 years ago—are also changing and evolving for a variety of reasons, including in response to guidance from the Higher Education Opportunity Act (HEOA) of 2008 and the expectations of students and their families. However, even with the HEOA guidance and the concurrent evolution of PSE programs, there remains a great deal of variation among the ever-growing number of PSE programs serving students with IDD.

Two comprehensive literature reviews illustrate the diversity among PSE programs that have existed from the 1970s to the present (Neubert, Moon, Grigal, & Redd, 2001; Thoma et al., 2011). More recently, Think College (http://thinkcollege.net), a project of the Institute for Community Inclusion at the University of Massachusetts Boston, has provided information on over 200 PSE programs currently active around the country. However, efforts to compare and contrast these diverse programs and evaluate their outcomes have been hampered by the lack of a systematic classification scheme or taxonomy. This lack was consensually identified during the discussions at the 2009 State of the Science Conference on Postsecondary Education for Students with Intellectual Disabilities (Conference Proceedings, 2009; see also McEathron & Beuhring, 2011).

The main challenge in developing a taxonomy is to determine which program characteristics will be the most useful for describing, comparing, and evaluating programs in common terms. The Thoma et al. (2011) literature review identified 47 PSE programs in the research literature from 2001-2010, but less than half of the journal articles reported enough information to be useful in defining elements that could be used to classify those programs according to their student and program characteristics. Similarly, programs listed on the Think College website differ considerably in the type and amount of information provided, making comparisons across programs difficult.

Published research on PSE program effectiveness is also of limited help in developing a common program classification scheme. Most evaluation studies of PSE programs for persons with IDD have relied on single-case studies or qualitative analyses of small samples (Hughson, Moodie, & Uditsky, 2006; Neubert et al., 2001; Thoma et al., 2011). These studies are inconsistent in how samples are defined and how programs are described and often make untested assumptions about the potential benefits of participating in a PSE program for all participants, regardless of the severity of their intellectual disability. Challenges in comparing outcomes are compounded by inconsistencies in how the term "intellectual disability" has been operationally defined (American Association on Intellectual and Developmental Disabilities [AAIDD], 2010) and the frequent failure to distinguish between program participants with intellectual disabilities and those with developmental disabilities that do not necessarily include cognitive deficits (Larson et al., 2001; Zafft, Hart, & Zimbrich, 2004).

As a result, the study described here, funded by the National Institute on Disability and Rehabilitation Research (NIDRR), was designed to create a taxonomy of PSE programs from the bottom up, starting with an in-depth examination of a small but diverse and representative sample of active programs across the country.

Methods

The study was conducted in two consecutive phases. First, the development phase used an in-depth study—based on comprehensive interviews and program documents—of a small but diverse sample of PSE programs for students with IDD to identify the key characteristics needed to classify such programs. Second, in the validation phase, a survey based on the taxonomy was administered to all known programs at institutions of higher education that served, or were likely to serve, students with IDD. The survey results and comments were used to improve the taxonomy's content validity and estimate its generalizability (external validity). Table 1 presents an overview of the two phases of the study; detailed explanations are provided in the following sections.

Documented Population of Programs and Sampling Frames

The initial challenge was to identify a population of programs from which a sample of programs could be drawn. The number of PSE programs for students with IDD in the US is in a period of great flux: new programs are being created, older programs are being discontinued, and still others are being revamped in response to changes in the field. Consequently, any comprehensive listing of these programs will be outdated almost as soon as it is constructed. Also contributing to the inevitable inaccuracy of comprehensive lists of programs is the fact that some programs are not well-publicized. In this article, we refer to the "documented population of programs" in recognition of the fact that more programs are likely to exist than are documented in publications, websites, or other public domain resources. Moreover, the fluctuation of the programs underscores the importance of clearly describing the documented population from which a particular sample of programs is drawn.

Of the available options, the Think College database identified the largest number of programs as a starting point. It included 138 programs in November

Table 1

Overview of Two Phases of Study

	Development Phase	Validation Phase
Documented Population	N=174 Programs As of May 28, 2012	N=198 Programs As of July 24, 2012
Sampling Frame	N=98 (56%) Programs at colleges or universities serving persons with AAIDD-defined ID, alone or with other DD	N=130 (66%) Expanded to include programs offered in partnership with an IHE, and those that serve persons with DD or all disabilities generally
Sample	N=34 (35%) Selected in two waves to represent regions, institutional settings, and program types	N=119 (92%) All programs in the expanded sampling frame with contact name and email address
Response Rate	N=21 (62%) Programs were representative of sample	N=47 (40%) Community colleges were underrepresented
Data Collection	Interviews Program Document Review	Survey
Data Analysis	Qualitative	Quantitative

2011, when options were being reviewed. The authors used information from the Think College database, along with information about programs known to the authors but not represented in the Think College database, to create a record of the documented population of programs over the course of the study. This record of the population was updated three times to incorporate changes in the Think College database and additional leads. These updates ensured that the most comprehensive list of programs available was used when identifying sites during the taxonomy development phase of the study and again when defining the sample for the validation phase.

At all points in time, the documented population of PSE programs was highly diverse, covering a broad range of settings, sponsors, and target populations. Not all of the programs were consistent with either the goal of the first phase of the study, which was to create a classification scheme (taxonomy), or the goal of the second phase of the study, which was to test content validity and determine external validity. Therefore, the sampling frame for the development phase was limited to programs that: (1) were located at 2- and 4-year colleges or universities; (2) were sponsored by an institution of higher education alone or in partnership with a public school or local education agency (these partnership-based programs are known as transition or "dual enrollment" programs); and (3) served students with intellectual disabilities as defined by clinical diagnostic manuals and advocacy organizations (e.g., AAIDD, 2010) or that served both students with intellectual disabilities and students with other developmental disabilities that may include intellectual disabilities as a secondary feature (e.g., autism). Using

these criteria, the May 2012 documented population of 174 programs was narrowed to a sampling frame of 98 programs that appeared to serve students with IDD at institutions of higher education, either alone or in partnership with a public school entity, based on information obtained from the Think College database and individual program websites. The characteristics of the documented population of programs at that time are summarized in McEathron, Beuhring, Maynard, and Mavis (2013).

The validation sample was drawn from a documented population that had increased to a net of 198 programs in July 2012 after taking both 36 additions and 12 deletions in the Think College database into account. The characteristics of the documented population of programs for the validation phase of the study are summarized in Table 2.

The validation sampling frame was broadened to include additional types of partnerships and more diverse target populations. Of the documented population of 198 programs, 130 PSE programs fit the criteria for the validation phase of the study (see Table 2). Specifically, the sampling frame now included programs co-sponsored by non-profit organizations, corporations, or state agencies. As a set, the 130 programs constituted two-thirds (66%) of the July 2012 documented population. This more diverse sampling frame provided a more rigorous test of the external validity, or generalizability, of the taxonomy than simply contacting non-participating programs from the more narrowly defined sampling frame used in the development phase.

A key caveat was that the process of determining which programs were eligible for the sampling frames relied on descriptions provided by the programs on their websites or for inclusion in the Think College database (based on survey responses). Program descriptions and survey responses may have been incomplete or out-of-date by the time they were reviewed in 2012 for this study. For example, the authors found that as the study progressed, especially during the validation phase, new information obtained resulted in re-categorization of some programs.

Development Phase Sample

A two-stage sampling strategy was implemented to ensure a diverse yet representative sample of programs for the taxonomy development phase. The first stage focused on selecting a diverse sample of programs from the sampling frame of 98 programs. Selections were based on a review of program listings in the Think College database and information on program websites. Invitations to participate in the study were sent to the program directors in November and December 2011 by email, with up to three follow-up contacts (two email, one telephone) between January and April 2012. Thirteen sites agreed to participate.

In the second stage, sampling focused on increasing the representation of programs at two-year community colleges and balancing the regional representation of programs. An additional 13 program directors in these underrepresented categories were contacted in May or June 2012. Follow-up was selective as the desired geographical and institutional setting slots were filled. Eight additional sites agreed to participate. Taken together, these two stages of sampling produced a diverse and representative sample of 21 programs. The combined response rate was 62% (21 of 34 programs contacted).

In the first stage, contacts were also made with directors of the disability services offices (DSOs) at the programs' host institutions in the expectation that they would provide an additional source of information. While this was true for a handful of programs, the non-response rate was high and many DSO staff had little knowledge of the PSE program at their institution. Consequently, we discontinued this effort during the second phase and focused on PSE program staff instead.

The final sample of 21 programs represented roughly one in five of all programs in the sampling frame of 98 programs for the development phase. The two-year institutions represented in the final sample were all community colleges; the four-year institutions included a mix of public and private universities, state universities, and liberal arts colleges. Six programs (24%) were partnerships between public secondary schools and institutions of higher education, also known as dual enrollment or transition programs. Seven (33%) were part of the new wave of postsecondary education programs funded under the TPSID initiative (OPE, 2010). Overall, the TPSID-funded programs, programs at two- and four-year institutions of higher education, and programs in the four major regions of the US (East, West, Midwest, and South) were represented in proportion to their numbers in the sampling frame.

Table 2

Documented Population of PSE Programs for Validation Phase (July 2012)

Setting and Sponsor	Target Population Served		Overall
	ID, IDD, DD, or "All Disabilities"	Other[1]	
Included in Validation Sampling Frame			
IHE alone (program)	50	0	50
IHE with local education agency (dual enrollment)	52	0	52
IHE with non-profit, state agency, or corporation	20	0	20
IHE with multiple partners	8	0	8
Subtotal	130	0	130
Excluded from Validation Sampling Frame			
IHE alone (program)	0	14	14
IHE alone (not a program)[2]	0	17	17
School/district or other local education agency alone	3	1	4
Non-profit, state agency, or corporation alone	15	11	26
Duplicate listing, error, or defunct	n/a	n/a	7
Subtotal	18	43	68
Total	148	43	198

[1] Any target population that excluded, or was likely to exclude, most or all persons with AAIDD-defined ID. See text for examples.
[2] This category encompassed standard services provided by the Disability Services Office to regularly enrolled individuals who self-identified with a disability.

Validation Phase Sample

The sample for the validation phase was the 130 programs in the expanded sampling frame (including programs that participated in the development phase) minus 11 programs for which no contact person was listed either in the Think College database or on the program's website. The resulting validation sample was thus comprised of 119 programs at two- and four-year institutions of higher education that alone or in partnership served, or were likely to serve, students with intellectual disabilities. Fewer programs than this actually received the survey because some contact information was incorrect (counts were not available for bounced survey emails or invitations that went undelivered due to invalid email addresses or staff turnover).

Programs that participated in the development phase were included in the validation phase for three reasons. First, the validation phase used a different method of data collection—a survey based on the new taxonomy—to collect program information not provided during the interviews or in published materials. Second, quantitative survey results for the participating programs provided a reference point for understanding how well the taxonomy generalized to the broader range of programs in the expanded sampling frame. Finally, excluding development-phase programs would have introduced systematic bias into the overall results by underrepresenting programs that explicitly served students with IDD, including many of the dual-enrollment and TPSID programs. Only by looking at the results for the entire sample would it be possible to see where additions, deletions, or revisions to the taxonomic elements might be needed in order to adequately capture the full range of variability among programs at institutions of higher education that served students with IDD.

The 61 programs excluded from the validation sample (68 total ineligible less seven duplicate, erroneous, or defunct program listings) were divided into two exploratory samples—Disability Services Offices (N = 17) and all others (N = 44)—that also received the survey in order to explore how some elements of the taxonomy might generalize to an even broader set of programs and services.

Development Phase Data Collection and Analysis

In-depth information about each of the 21 programs that participated in the development phase was obtained from two or more of the following sources: interviews with key program and college staff, program materials shared with the researchers, and information published on program websites. A comprehensive interview exploring program characteristics, students served, and administrative issues was developed using the preliminary taxonomy as a guide (McEathron & Beuhring, 2011).

A total of 27 interviews were conducted: 15 were individual interviews with one person (PSE program director, coordinator, staff member or, in one case, a DSO director) and six were interviews with two people (PSE program director and staff member for two sites; a program director and a DSO director for four sites). Interviews for two sites were conducted in person; the remaining interviews were conducted by phone. Participating program directors, program staff, and DSO directors were generous with their time and knowledgeable about their programs. Interviews with program representatives typically lasted 40-60 minutes. Interviews with DSO directors lasted between 10 (if there was no contact with the program) and 35 minutes (if there was a close working relationship).

All interviews were recorded with permission. Participating programs were guaranteed confidentiality, even though none expressed concerns about being identified. Several program directors expressed an interest in networking with others in the study in order to share lessons learned and problem-solve with colleagues who understood their challenges.

Building on earlier work (McEathron & Beuhring, 2011), the analysis for the development phase focused on identifying distinct categories of characteristics that could be used in the continued development of the Taxonomy for Postsecondary Programs for Students with IDD and, in combination, fully capture the differences and similarities among these programs.

The taxonomy was organized into three hierarchical levels: domains, components, and elements. The identification of these levels was based on the concurrent analysis of interview transcripts and program materials. Each transcript and document—over 600 pages in total—was uploaded into NVivo, a computer software package that supports the analysis of qualitative data. The process of coding was emergent and iterative. A few themes and categories were identified at the beginning of the analysis; however, we let the actual passages from the interviews and program materials drive the process as we constructed, organized, and re-organized the coding. Using NVivo also allowed us to recombine

codes as the taxonomy evolved and to test connections within the data. The taxonomy that emerged from this process was later refined based on feedback from the participating programs via an online survey (see a description of the survey in the Validation Phase section below). The survey responses supplemented the coded data from NVivo, and in some instances provided new information that was not available from the interview transcripts or program materials.

Validation Phase Data Collection and Analysis

A 28-question online survey was created based on the taxonomy that emerged from the development phase of the study. Each of the 28 survey questions represented a taxonomic component or element (such as program priorities); the response options for each question represented levels of the component or element (such as – in the example of program priorities—college experience, vocational training, and social skills). Pilot testing indicated that the survey could be completed in 15-20 minutes. In late November 2012, an email invitation to complete the survey was sent to all 119 programs in the sample; a second request/reminder was emailed a week later; the response deadline was a week after that.

The response rate varied substantially depending on the subgroup. Within the validation sample, the response rate was much higher among programs that had participated in the taxonomy development phase than among programs that had not: 71% (15 of 21) versus 33% (32 of 98), respectively. The combined response rate of 40% (47 of 119 programs) was low in part because of the untested contact information, the short two-week response window, and limited opportunity for follow-up during a holiday period. The survey was an unfunded addition to the original study and, as such, had to be developed and administered more efficiently than would have been the case if it had been part of the original research plan.

The response rate for the exploratory subgroups was consistent with what might be expected given the taxonomy's expected lack of relevance to programs and services that had been excluded from the sampling frame: none of the 17 DSOs (0%) and only 10 of 44 others (23%) returned a survey. Given the small number, data from the latter subgroup were not analyzed.

The purpose of the validation phase was to provide a preliminary assessment of the external validity of the new taxonomy to a broad range of programs and to refine the taxonomy's content in ways that improved its usefulness as a classification tool (e.g., by adding classification options). This was done through descriptive analyses of survey responses and a review of survey comments.

Due to the fact that many of the 28 survey questions required multiple independent responses (e.g., "rate the importance of each of the following" or "check all that apply"), there were 85 discrete items for analysis (e.g., ratings of the importance of education, social skills, and providing a college experience as program priorities). Responses for each discrete item were reviewed separately for the 15 respondents from the development sample and 32 respondents from the remainder of the expanded sampling frame. For each, the number of blank and not applicable responses was reviewed as an indicator of the relevance of the responses to both the development and remainder samples (content validity). In addition, the distribution of responses among programs in the two subsamples was compared to assess how well taxonomic components, elements, and levels that had been identified with a narrowly defined development sample would generalize to a more diverse set of programs (external validity). Finally, comments were reviewed to determine whether content validity or external validity might be improved by adding new elements to the draft taxonomy, adding levels to existing elements, or clarifying the language of the draft taxonomy.

Statistical analyses, such as non-parametric Chi Square, were not appropriate because the differences between the two subgroups were never of sufficient magnitude to be statistically reliable given the sample sizes. More importantly, the two subgroups were inherently different, with the development sample reflecting a more narrowly defined range of programs than those in the validation sample.

Results

While the results of the two phases of the study are presented consecutively below, the process of analyzing and clarifying components and elements of the taxonomy was more iterative. For example, the comprehensive PSE Taxonomy is presented under the results for the development phase for clarity; however, one of the elements—Program Sponsor under Institutional Components—was actually identified and refined during the validation phase.

Development Phase Results

The following sections describe how we identified the four major domains (Organizational, Admissions, Support, and Pedagogical) as well as the components and elements that make up those domains (see Table 3). When illustrative, we include the evidence from the interviews or program materials that provide the basis for our designation.

Organizational Domain. This domain includes both Program and Institutional Components. These two components and the elements that comprise them describe the general characteristics of the program and the institutional setting. Within the Program Components, Program Characteristics describe the basic parameters of the program, including its duration, its age, and the type of institution in which it is housed. These delineate the foundation of the program as well as provide a structure for clarity when comparing programs. For example, the programs that participated in the study were situated in both two- and four-year postsecondary institutions; however, the program duration, which ranged from one to four years, did not necessarily correspond to the institution type. Additionally, staff at a few programs mentioned that they did not have a set program duration; student interest and person-centered planning determined how long a student attended the program.

We included the Program Funding Sources and Program Goals in this domain since these express the vision or mission of the program planners and therefore yield differences in program intent and focus. Program funding sources identified in the study included student fees, grants (state and federal), community donations, and university or college support. While there were similarities among programs' stated goals (such as providing an opportunity for students to learn new academic, employment, independent living, and/or self-determination skills in a college setting), some programs also noted additional goals such as providing students with skills in an inclusive supportive setting, supporting students' development, molding contributing citizens, and providing a general college experience. Several sites indicated that the goals of their program did not explicitly include improving students' academic skills. Again, the strength of the taxonomy is its ability to identify and distinguish among these similarities and differences.

Four elements comprised the Institutional Components: Program Sponsor, Program-College Affiliation, Overall Institutional Climate, and Faculty Outreach and Training. All study sites participating in the Development Phase of the study were sponsored by (e.g., administered by or contained within) the institution of higher education in which they were located. However, some programs were also co-sponsored by other agencies or organizations such as secondary schools or non-profit organizations. In addition to being sponsored by the institution of higher education, programs were also usually affiliated with one or more departments or units within the institution. Typical affiliations included Colleges or Departments of Education, Extension or Continuing Education, Disability Services, the Office of Student Development, or a combination of these. Three programs reported that they were stand-alone programs within the college or university and, as such, were not officially affiliated with any campus department or office. Based on this study, we were able to identify characteristics of institutional climate that included level of college administrative support, campus-wide awareness of the program, and campus policies that supported and welcomed PSE program participants.

The faculty outreach and training element specified which faculty were included in program outreach efforts (program and non-program faculty) and the purpose of contacting faculty (permission for PSE participants to take a class, curriculum development, professional development in universal design, raising awareness about PSE for students with IDD).

Admissions Domain. The Admissions Domain is comprised of six main components. The first five—Student Enrollment Status, Academic Skills, Functional Skills, Behavioral Skills, and Admissions Selectivity—represent the characteristics or criteria that programs use for selecting and admitting students. Just like college and university programs in general, these programs vary considerably in their expectations and prerequisites of students and, as was noted in a number of interviews, often diverge from stated policies. The last component of this domain specifies the cost of attending.

Student enrollment status focuses on high school completion—that is, whether or not a program requires students to have finished their secondary schooling before enrolling. Sites that serve students still enrolled in high school are able to take advantage of their dual enrollment status, which makes them eligible for services, including funding, from their high school per the Individuals with Disabilities Education Act (IDEA). However, about two-thirds of the programs in the study

Table 3

Domains, Components, and Elements of the PSE Taxonomy

Organizational Domain	Admissions Domain	Support Domain	Pedagogical Domain
A. Program Components 1. Program Characteristics a. Type of Institution b. Program Duration c. Program Age (History) 2. Program Funding Sources a. Student Fees b. Grants c. University or College Support d. Community Donations 3. Program Focus or Goals a. Improved Academic Skills b. Improved Employment Skills c. Improved Independent Living Skills d. Improved Social Skills e. General College Experience **B. Institutional Components** 1. Program Sponsor[1] 2. Program-College Affiliation 3. Overall Institutional Climate 4. Faculty Outreach and Training	**A. Student Enrollment Status** 1. High School Student 2. Exited High School **B. Academic Skills** 1. Third- to Sixth-Grade Level of Reading, Writing, & Math 2. No Academic Skills Criteria for Admission **C. Functional Skills** 1. Communication Skills 2. Organizational Skills 3. Navigational Skills 4. Technology Skills 5. Independent Self-Care[1] **D. Behavioral Skills** 1. Self-Regulation 2. Student Motivation **E. Admissions Selectivity** 1. Open Enrollment 2. Competitive Selection **F. Tuition and Fees**	**A. Program/School-based Support** 1. Academic Mentors/ Coaches/Advisors 2. Career Counseling/ Advising 3. Independent Living Supports 4. Social Mentors 5. Behavioral/ Emotional Counseling 6. Post-program Transition Supports **B. Agency Support** **C. Family Support** **D. Financial Aid** 1. Vocational Rehabilitation or Other State Funding 2. Pell and Other Grants 3. Scholarships 4. Student Family Funds 5. Secondary Schools	**A. Academic Components** 1. Course Integration a. Only Integrated Coursework b. Primarily Integrated Coursework c. Half Integrated Coursework d. Mainly PSE Program Coursework e. Only PSE Program Coursework 2. Credits a. Transferable Credits b. Non-transferable Credits c. Audit d. Guest in Classroom 3. Certificate or Degree a. College Certificates Available to All Students b. PSE Program Certificates **B. Vocational Components** 1. Vocational Coursework 2. Internships **C. Independent Living Components** 1. Independent Living Coursework 2. Housing **D. Social Components** 1. Social Skills Coursework 2. Social Activities

[1] These elements—Program Sponsor and Independent Self-Care—were identified during the Validation Phase of the study

were set up to support students 18 and older who had exited secondary school and wanted to continue their education after completing high school or aging out of the K-12 system.

Student academic skills required for admission could include reading, math, writing, and critical thinking skills. Although most sites stated that they require 3rd grade academic skills at a minimum, they noted that students' skills range from lower elementary to middle school. Some programs indicated that they do not have academic skills criteria for admission to their program.

Functional and behavioral skills are distinguished in the taxonomy. Functional skills refer to students' interpersonal abilities and capacity to manage their daily lives, as well as communication skills, organizational skills, navigation skills, technology skills, and independent self-care. The main behavioral sub-elements identified in this study were self-regulation and motivation. A number of programs noted that motivation to attend college was as important as many of the other admissions criteria, if not more so.

Program admissions selectivity varied by the number of applicants and by the percentage of applicants accepted. Programs in two-year community and technical colleges tended to mirror the open admissions policy of their institutions. Additionally, many programs tried to be as accommodating and welcoming as possible, but several programs reported having a more selective admissions process or funding structures that limited how many students could be in the program at any given time.

The amount of annual tuition and fees for each program were obtained from interview participants or program documents or estimated based on information available on the program's website. For public institutions, the tuition was calculated using in-state resident or within-district rates. In cases where students' enrollment status (i.e., part-time or full-time) varied or was not specified, tuition was estimated based on six credits per semester. These figures represent the actual cost to the family and do not include the portion covered by local education agencies (LEAs), vocational rehabilitation, Medicaid, scholarships, the institutions themselves, or other grants to the programs. Based on our analysis, the annual tuition and fees ranged from $0 to $32,125.

Overall, PSE program tuition follows an expected pattern, with the community colleges having the lowest tuition, state schools having slightly higher tuition, and flagship universities and private schools having the highest tuition. However, some universities were able to completely cover tuition for families or at least reduce it by allowing students to audit courses for free. Otherwise, students typically used scholarships or loans to pay part or all of the tuition and fees, depending on the program (see discussion on financial aid in the Support Domain section). For programs with residential components, families were also required to cover the cost of room and board, which ranged from about $8,000 to $15,000 annually.

Support Domain. All of the programs that participated in the study reported using a variety of supports for a successful student experience. We identified four primary components of this domain: School or Program-Based Support, Agency Support, Family Support, and Financial Aid or supporting funding sources.

Within the School or Program-Based Support component are six categories. First, programs provide academic support to students through the use of tutors, peer mentors, hired academic coaches, and campus resources such as tutoring and writing centers; however, programs also varied on the levels of support within each of these categories. For example, in some programs the mentors for academic support were available to help students get settled for the first few weeks, figure out their schedule, understand the syllabus, and then are available as needed. In other programs, students are required to meet with academic coaches regularly.

Second, some programs have career counselors, typically provided by the campus career center. Third, some programs with students who live on campus or in school-affiliated off-campus housing provide residential support to students. These supports are resident assistants or mentors who help students learn independent living skills such as how to do laundry. Fourth, many programs help students participate in the community, either by providing them with special resources or pairing them with peer mentors who attend events with them and provide social support. Peer mentors may attend planned events as well as just hang out with the students. Lastly, some programs provide behavioral/emotional counseling and post-program transition supports.

A few programs mentioned working with external agencies that help students with life skills, career development, and post-program job placement. These may include government offices such as Vocational Rehabilitation or independent organizations. Additionally,

a number of sites noted that parents were considered important sources of support and are encouraged (and in some cases required) to actively participate in their sons' and daughters' lives. However, sites also recognized that college was a new, transitional period for both students and their parents. A few sites discussed working with parents and students to support this change in their lives.

Students fund their participation in PSE programs using a variety of sources: Vocational Rehabilitation or other state funding; federal (including Pell), state, or local grants; scholarships (either from the program itself or from community organizations); secondary schools (for dually enrolled students); and family funds. The range of funding options varied greatly among programs. Some programs mentioned the possibility of applying to become a Comprehensive Transition and Postsecondary Program (CTP) site (see http://studentaid.ed.gov/eligibility/intellectual-disabilities), which enables programs to access federal financial aid as delineated in HEOA (i.e., Pell grants and work-study); however, only three sites listed Pell grants as options for funding. One program's materials mentioned the scholarships available from the National Down Syndrome Society. A few programs noted that students must have the ability to "pay privately" for at least a portion of their program.

Pedagogical Domain. The Pedagogical Domain is comprised of four main components: Academic, Vocational, Independent Living, and Social. Academic components are the cornerstone of postsecondary programs and a strong influence on the overall student experience; the same holds true for PSE programs for students with IDD. This research identified four essential elements that together provide a clearer understanding of how PSE programs differ in regard to academics: (1) level of course integration, (2) type of credits awarded, (3) extent of course selection, and (4) type of credential awarded upon completion.

Based on the descriptions provided by the participating sites, we identified five distinct levels of course integration: (1) All integrated coursework, (2) Primarily integrated coursework, (3) Approximately 50% integrated coursework, (4) Mainly PSE program coursework, and (5) All PSE program coursework. For example, "All integrated coursework" means that all the courses students with IDD enroll in are offered to the general college population. "Primarily integrated coursework" indicates that students with IDD take most of their courses with general college students, but also take one or two PSE program-specific courses or seminars.

The second element captures the manner in which students receive credit for their coursework. Sub-elements of this category included: (1) Transferable credits, (2) Non-transferable credits, (3) Audit, and (4) Guest in the classroom (No official credit given). The type of credit awarded was often primarily determined by student interest and ability. In some cases, students' options of type of credit to be earned depended on the level of support the professor or program was able to provide to students with IDD enrolling in regular college courses.

Programs varied in whether students could earn transferable credits—that is, credits that could be applied toward a college degree at the host institution or other institutions of higher education. In half of the PSE programs in the study, many of the students received non-transferable credits for the courses they took. In most cases, these credits count toward the student's completion of the program or certificate but cannot be applied to other programs.

Over half of the participating programs allow students to audit courses. Auditing students' level of participation in class varies between and within programs. Some students participate in all course activities, while others are more like observers of the class. In a few programs, students may attend regular college courses as a guest but not officially audit them.

While current PSE programs are not generally designed for students to earn college degrees, most allow students to graduate by earning some sort of a certificate, either from the program itself or from the college. Certificates offered by the college are typically available to all students, with or without disabilities. Several programs also mentioned that they are in the process of developing program-specific certificates for their students.

The usefulness of the taxonomy is predicated on how well the discrete components and elements can be compared and contrasted to highlight the variety and distinctions among PSE programs. Table 4 illustrates how level of integration and type of institution may affect the credits or certificates that participating students receive. For example, students attending integrated programs at two-year institutions tended to receive more transferable credits than students in integrated programs in four-year institutions. Students in almost all of the integrated programs in four-year colleges

Table 4

Credit and Certificate Options by Level of Course Integration and Two- and Four-Year Sites

	Credit				Certificate	
Levels of Integration	**Transferable**	**Non-Transferable**	**Audit**	**Guest**	**College**	**PSE Program**
100% or Primarily Integrated						
College 2A	✓+++		✓-			
College 2C	✓++		✓++		✓	
College 2D	✓++		✓++			✓
College 2F	✓++	✓++	✓-		✓	
College 4B			✓+++			✓
College 4E	✓-	✓-	✓+++	✓-		
College 4F			✓+++			✓
College 4H			✓++++			
College 4I		✓-	✓+++			✓
College 4J				✓++++		
College 4K			✓++++			✓
Half Integrated						
College 2B	✓+	✓++	✓+			✓
College 2G	✓+	✓++	✓-		✓	
College 4A	✓-	✓+++	✓-			✓
Mainly PSE Program Courses						
College 2E	✓+	✓+++				✓
College 2I		✓++++		✓-		✓
College 4C		✓++++				✓
College 4D	✓-	✓+++	✓+			✓
College 4G		✓++	✓+			✓
College 4L	✓-	✓+++	✓++		✓	
Not Integrated						
College 2H		✓++++				✓

Source: Interview and survey data

✓- = Seldom occurs (less than 10%
✓+ = Occurs infrequently (approx. 25%)
✓++ = Occurs moderately (approx. 50%)
✓+++ = Occurs frequently (approx. 75%)
✓++++ = Occurs 100% of the time

participated by auditing classes. Students attending less integrated programs in both two- and four-year institutions received mostly non-transferable credits. As noted above, many programs said that students could receive transferable credits, but it was not possible to determine how frequently that occurred. To protect the confidentiality of the participating sites, a simple two-digit code was assigned to each program so that the study authors could report on similarities and differences among programs without revealing program names.

The last three components for the pedagogical domain are Vocational, Independent Living, and Social Components. Programs vary in the vocational components they include, although all sites identified this as an essential part of their curricula. When asked what percentage of their program was employment-related, sites responses ranged from 45% to almost 100%. We identified two distinct elements within this component: Vocational Coursework, including career exploration activities, and Internships. Based on the study, we identified four sub-elements for Vocational Coursework: Career Exploration Coursework and Activities, Service Learning, Soft Skills, and Work-based Training. Most sites in the study include internships—on- or off-campus, paid or unpaid—as part of their programs.

We identified two elements within the Independent Living Component: Independent Living Coursework and Housing. The majority of programs offered the former to develop and enhance students' skills in four areas: daily living, financial, health and wellness, and transportation skills. The sub-elements for Housing include on-campus housing, campus-affiliated housing, and independent housing (whether living with their family, in an apartment, or in a group home). Although many students continued to live at home, a majority of programs discussed supporting students to live independently whenever possible.

The Social Components of PSE programs include coursework related to social skills and social activities, both campus events and program events. A few programs reported offering courses specifically related to social skills, such as courses on diversity, communication, and dating and relationships.

Almost all of the programs allow students to participate in campus activities such as sports events, fairs, and student groups. Students also generally have access to campus resources such as recreation centers. Students are often free to join whatever clubs suit their interests. Programs emphasized that while they may encourage participation in college activities, the level of participation depends on each student. In addition to alerting students to campus events and connecting them with peer mentors, some programs provide their own activities to encourage social development and replicate the college experience.

Validation Phase Results

Classic validity theory considers evidence of validity to be the outcome of an evaluative integration of multiple sources of data which, taken together, support the inference that a measure is assessing what it intends to measure (Cizek, 2012; Messick, 1989). In practice, it is a recursive process in which each successive assessment of validity reveals opportunities to improve the instrument and expand its evidence base (Cizek, 2012). In this study, the administration of a survey to the expanded sampling frame represented the initial gathering of evidence regarding the preliminary taxonomy's validity for the diverse set of programs at institutions of higher education that alone or in partnership served, or were likely to serve, students with IDD. Recall that the expanded sampling frame included institution of higher education partnerships with non-profit organizations, state agencies, and corporations as well as local education agencies; it also included programs that served students with unspecified developmental disabilities, a broad range of disabilities, or all disabilities, in addition to programs that served students with AAIDD-defined ID alone or jointly with DD.

The high response rate from Development Phase sample of programs, together with the nature of responses from the other programs in the sampling frame, suggested that the taxonomy-based items were sufficiently relevant to be worth a program director's time to complete the survey. Consistent with that inference, respondents only occasionally left survey items blank or marked "does not apply." By contrast, none of the 17 DSOs responded to the survey, which was consistent with their pre-survey coding as services for regularly enrolled individual students rather than programs for groups of students with IDD. Only 10 of the 43 other programs excluded from the expanded sampling frame returned surveys (23%). Those that did respond skipped many or most items, or rated them as not applicable; some commented that the survey as a whole did not really apply to them. This was consistent with the pre-survey coding of the "other" programs as qualitatively different from the institution of higher

education programs included in the expanded sampling frame. Due to the low response rate and incomplete surveys, however, it was not possible to determine whether a subset of the taxonomic elements might have been useful for characterizing the 60 excluded programs and services.

The principle of recursive validation (Cizek, 2012) was illustrated by the modifications to the draft taxonomy that grew out of the process of classifying programs and responding to comments from survey respondents. As a result, we added "program sponsor" as an element in Institutional Components and "independent self-care" as a new sub-element in Functional Skills.

External validity indicates the extent to which the results obtained with a specific sample can be expected to generalize to the larger population from which the sample was drawn (Cizek, 2012; Messick, 1989). The concern is that a product like the taxonomy might be idiosyncratic to the sample on which it was based. The expanded sampling frame, which included a broader array of programs than the taxonomy development sample plus 36 programs that were not part of the documented population at the time the taxonomy was developed, provided a meaningful preliminary assessment of external validity. Overall, the distribution of responses for the 15 programs that were part of the taxonomy development sample was more restricted than the distribution of responses for the remaining 32 programs that were part of the expanded sampling frame. This was consistent with the fact that the taxonomy development sample was a more focused subset of the expanded sampling frame. The fact that the same response options applied to both the development sample and the validation sample, however, is initial confirmation of the generalizability of the taxonomy to the population of programs for which it was intended.

Applications of the PSE Taxonomy

The summary presentation of the evidence and logic used to create the taxonomy provided above addresses the first goal of this paper. An additional, and perhaps more important, goal of the study was to create a taxonomy that would be useful not only to researchers but also to program developers, students, and their families. Therefore, the authors created a matrix that could be used to develop easily comparable profiles for PSE programs. Table 5 presents the template for the matrix.

Table 6 presents an example based on information from an actual, de-identified program from the development phase. The program at ***College 4I*** is a two-year program at a four-year college. It does not require that applicants possess any specific academic skills; nonetheless, it has a competitive admissions selection process (far more applications are received than students accepted and admitted to the program). The program is fully integrated (all of the courses students with IDD enroll in are offered to the general college population) with graduate students providing academic coaching and mentoring. There is no on-campus housing available; annual tuition is $11,000.

Discussion

The structure and organization of this version of the PSE Taxonomy differs significantly from the preliminary taxonomy developed in 2011 (McEathron & Beuhring, 2011). Two interconnected aspects from the preliminary taxonomy bear discussion: the ecological model and person-centered planning. While the authors find both of these critically important, the process of refining the taxonomy led to the realization that the domains, components, and elements needed to be under the sole jurisdiction of the programs as the taxonomy is a classification of programs, not of individuals or of systems. Thus, the taxonomy characterizes how programs view student characteristics via criteria for admission in the Admissions Domain and institutional characteristics via measurable policies and practices in the Organizational Domain.

In fact, the focus on what can be currently observed within and understood about a program, rather than what would be ideal, grants the current PSE Taxonomy its clarity and foundation. For example, person-centered planning was a central component in the preliminary version but is not specifically listed in the current version. This is not because it is not important or valuable. Person-centered planning is often used as shorthand for designating a type of program that provides an individualized, authentic college experience (e.g., selection of course driven by individual interest). Every program that took part in our study said that they used person-centered planning – which again is highly commendable – however, programs differed widely as to how many individually different courses students actually took. In some programs, students might take nearly all the same core courses

Table 5

Significant Domains, Components, and Elements of PSE Taxonomy Matrix

PSE Taxonomy Matrix					
Organizational Domain	Type of Institution	Program Administration or Sponsor	Program Length	Program Funding Sources	Program Goals
Admissions Domain	Student Status	Student Academic Skills	Student Functional & Behavior Skills	Selectivity	Tuition & Fees
Support Domain	School or Program Based Support	Agency Based Support	Family Support	Financial Aid	
Pedagogical Domain	**Academic Components** Integration Credit Certificate/ Degree	**Vocational Components** Coursework Internships	**Independent Living** Components Coursework Housing	**Social Components** Coursework Activities	

with just one or two courses that seemed individually selected. Even those choices might be limited by the small number of possible courses. Therefore, the current PSE Taxonomy provides a more direct way to characterize programs by focusing on percentage and types of courses in conjunction with level of integration and credit options, rather than just the occurrence of person-centered planning.

The limitations of this study primarily stem from sampling challenges. While defining the documented population and sampling frame, the classification of programs was based on published information that was often incomplete, sometimes inaccurate and constantly evolving. For example, the documented population becomes quickly outdated as the documented population via the Think College database continues evolving after a snapshot is taken, illustrated by the fact that 217 programs and initiatives are now listed in the Think College database (compared to the 198 programs listed in 2012). These continuous changes could influence the completeness and generalizability of the taxonomy over time.

In addition, the use of semi-structured interviews as the primary data collection technique also presents limitations. While the taxonomy is likely representative of other PSE programs, the qualitative method does not allow for the generalization to all programs in the documented population. The taxonomy is based on what the interview participants shared with the researchers, and it is possible that other useful details would have emerged if the participants had been asked directly about each component and element. The researchers used the survey to partially counter this limitation and allow sites to answer questions that were standardized across programs. Unfortunately the validation survey had a very limited response rate and was intended to improve the taxonomy rather than provide a final test of the taxonomy's external validity.

Lastly, the lack of input from DSOs may limit the completeness of the taxonomy in cases where the DSOs were knowledgeable about their institutions' PSE program. The researchers did contact DSOs initially, but found that many were not aware of the program on their campus or did not know much more

Table 6

PSE Taxonomic Program Profile for College 4I

Domains	Components and Elements				
Organizational	Type of Institution Four-year IHE	Program Sponsor IHE	Program Length 2 Years	Program Age 5-10 Years	Program Goals Academic Vocational Ind. Living General College Exp.
Admissions	Student Enrollment Status Both in High School & Exited High School	Student Academic Skills No Criteria for Admission	Student Functional & Behaviorial Skills Communication Student Motivation Self-regulation	Admissions Selectivity Competitive	Tuition/Fees $11,000 / year
Support	School/ Program Based Academic Mentors/ Coaches (Grad Students)	Agency Based State Agencies Private Disability Vendors	Family Support Required	Financial Aid/Funding Sources Family Funds Scholarships LEA Medicaid Waivers	
Pedagogical	Academic Coursework: Fully Integrated 75% Audit 25% Guest in Classroom PSE Program Certificate	Vocational Coursework: Soft skills Internships (2 unpaid)	Independent Living Coursework: Daily Living Skills Financial Skills No On-campus Houseing	Social Coursework: Interpersonal Communication	

than the fact that they existed. Through this limitation, the study revealed the disconnect between DSOs and PSE programs at many institutions. The taxonomy may help administrators distinguish between DSO and PSE program services.

The current taxonomy has many potential applications that span from research to policy to practice. One of the primary purposes of the tool is to help researchers identify areas for future investigation. While the taxonomy highlights common components and elements in PSE programs, additional research will need to explore the extent to which these are working and to identify essential elements that are missing from PSE programs. Future research could also compare the outcomes for programs with different foci to determine if some domains or components are more essential for academic or vocational success. Policy makers could use the taxonomy to better understand what is happening in PSE programs, how they compare to other programs, and how to move forward with development and funding. Finally, program administrators could use the taxonomy to create standard comparable program profiles to help future students and families identify appropriate programs. Administrators may also use the taxonomy as a guide to reflect on and change the structure of their programs.

Conclusion

The field of PSE for students with IDD is in a highly fluid, evolving state. It is anticipated that over time certain aspects of the domains and elements of the taxonomy may change and that the taxonomic profile of a program may also change. Nonetheless, even in its current iteration, the PSE Taxonomy provides a mechanism for combining elements to provide a more comprehensive understanding of PSE programs, to clarify differences and similarities between programs, and to develop succinct, easily comparable program profiles based on a PSE Taxonomy Matrix (see Table 6). Most importantly, the PSE Taxonomy can support further research on student-level outcomes of PSE programs.

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